WATER QUALITY
AND
QUANTITY SURVEY

SOUTH SHORE
OF LAKE RAMSEY AREA
CITY OF SUDBURY

APRIL 1976

Ministry
of the
Environment
Ontario

R. E. Moore
Director
Northeastern Region

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AND

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Ministry of the Environment.

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TABLE OF CONTENTS

SUMMARY

The Council of the Regional Municipality of Sudbury passed a resolution requesting that the Ministry of the Environment install communal water and sewer services to serve the residents on the South Shore of Lake Ramsey. In order to evaluate the need for communal services a water quantity and quality survey was carried out by members of the Municipal & Private Abatement Section during July, 1975.

Samples collected from 81 of the 100 permanent residences, and 3 of the 50 seasonal residences in the area, were examined for bacteria and analyzed for chemical quality.

Bacteriological examination results showed coliform organisms in 36% of the wells and 28% of the surface water supplies sampled.

Iron concentrations were above the Ministry of the Environments recommended limit in 36% of the samples analyzed. Colour exceeded the criterion in all samples analyzed, chlorides in 5%, conductivity in 15%, and turbidity in 50%. All other parameters analysed for, were within the Ministry standards for potable water supplies.

It appears that the problems discovered during the survey can be solved on an individual basis by filtration and/or chlorination of the raw water before consumption.

Chlorinators should be installed on all systems using Ramsey Lake as a source of water supply whether or not coliforms were detected during this survey.

INTRODUCTION

The installation of communal water and sewer services for the south shore of Lake Ramsey was considered by the City of Sudbury prior to the creation of the Regional Municipality of Sudbury. In the Sewer and Water Priorities report prepared by staff of the Regional Municipality of Sudbury in 1974 the installation of communal services in this area was ranked 14th in the order of priority of the 18 areas considered. Due to the extremely high costs of installing services in this area the Regional Municipality requested that the Ministry of the Environment install the services as a subsidized project. In order to determine if there were health and environmental problems in the area that could be corrected by the installation of communal water and sewer services, the Municipal & Private Abatement Section conducted a survey of existing private services.

The area surveyed consists of the built up portion of the south shore of Lake Ramsey north of Ramsey Lake Road and South Bay Road from Paris Street to Keast Drive (see attached map).

During the period from July 15 to 29, drinking water supplies in the majority of homes in the area were sampled. Samples were analyzed for chemical quality and examined for bacteria.

The majority of homes in the area (61.5%) utilize Ramsey Lake as a potable water supply. Approximately 19% of these chlorinate the raw lake water before use. The remainder of the residents utilize water obtained from drilled wells. A large percentage of residences in the area utilize private sub-surface sewage disposal systems.

The Sudbury-Algoma Sanatorium also obtains water from Ramsey Lake and chlorinates it before use. A small sewage treatment plant which discharges into Bethel Lake is used to treat domestic sewage from the sanatorium.

Precipitation was recorded by the Atmospheric Environment Service on 5 of the 15 survey days. The total rainfall for the month of July was 1.41" (normal 3.27") of precipation and ranged from a trace on July 25 to 0.73 inches on July 24th with 0.32 inches being recorded in July prior to the Survey.

PROCEDURES

Samples were collected from residences in the survey area from July 15 - 29, 1975. All residences in the area were visited, however, samples were collected only if persons were at home. During the course of the survey, samples were collected from 81 of the 100 permanent homes and from 3 of the 50 seasonal residences in the area. (Figure for number of permanent and seasonal homes taken from "Sewer and Water Priorities Unserviced Areas" prepared by the Regional Municipality of Sudbury).

A questionnaire was filled out by staff in the presence of the homeowner to determine the source of water supply, any quantity or quality problems, and the method of sewage disposal. Persons interviewed were also asked if they had experienced any problems with their private sewage disposal systems.

Samples collected for bacteriological examination were examined for total and faecal coliform organisms at the Ministry of Health laboratories in Sudbury. Samples sent to the Ministry of the Environment laboratories in Toronto were examined for coliforms, faecal coliforms, faecal streptococci, faecal pseudomonas, and faecal clostridia.

Chemical analyses carried out at the Ministry of the Environment laboratories in Toronto included hardness, alkalinity, iron, chlorides, pH, colour, turbidity, conductivity, and nitrates.

Samples were delivered to the Ministry of Health laboratories in Sudbury or shipped via courier to Toronto at the end of each day to minimize the delay in processing.

SURVEY RESULTS

WATER QUALITY

(a) Bacteriological Quality

Samples were collected from 81 of the 100 permanent and 3 of the 50 seasonal dwellings in the area. Of these 27 showed the presence of coliform organisms while 5 showed the presence of faecal coliform. Eleven of the samples containing coliforms only were collected from wells and 15 were collected from surface supplies. All but 1 of the samples containing faecal organisms were collected from homes using Ramsey Lake as a source of supply. Total coliform counts ranged from 2 to 14/100 ml while faecal coliforms ranged from 2 to 4/100 ml. Persons whose water contained any coliform organisms were contacted by letter and informed that all water to be used for human consumption should be boiled or disinfected.

(b) Chemical Quality

Iron

Iron concentrations in samples collected ranged from 0.05 mg/l to 4.30 mg/l. A total of 30 samples had iron concentrations above this Ministry's standard of 0.3 mg/l for a potable water supply. High iron was present in 8 of the samples from residences utilizing lake water as the source of supply and 22 of the samples from residences utilizing a well supply.

Hardness and Alkalinity

Hardness ranged from less than 1 mg/l to 61 mg/l in water taken from Ramsey Lake and was considerably higher (up to 414 mg/l) in well supplies.

Alkalinity ranged from 0.16 mg/l to 235 mg/l in samples collected from surface sources and from 9 mg/l to 271 mg/l in samples collected from wells.

Chlorides

Chlorides were above this Ministry's standard of 250 mg/l in 4 of the 84 samples collected. Three of these samples were collected from well supplies and one was from the surface supply.

pH (Hydrogen Iron Concentration)

pH ranged from 5.7 to 8.0 in all samples collected. All but one of the samples were within this Ministry's limit which ranges from 6.0 to 8.5.

Colour

Colour ranged from 5 to 200 and was above this Ministry's standard of 5 apparent colour units in all of the samples collected.

Turbidity

Turbidity ranged from 0.3 FTU to 48 FTU. Generally higher turbidity was observed in samples collected from well supplies. Turbidity was above this Ministry's recommended limit of 1 FTU in 41 of the samples collected.

Conductivity (Specific Conductance)

Conductivity which can be related directly to dissolved solids, ranged from 235 to 2,250 micromhos/cm in the surface supplies and from 97 to 1,550 micromhos/cm in the ground water supplies. Conductivity was above this Ministry's standards in 10 of the well supplies and in 3 of the surface supplies sampled.

Nitrates

Nitrate concentrations were less than 0.2 mg/l in all but one sample analyzed. All water examined was well below this Ministry's standards of 10 mg/l for nitrates.

Persons were notified by letter if their water did not meet chemical criteria.

QUESTIONNAIRE RESULTS

(a) Water Quantity and Quality

Water quantity problems were reported in 7 cases; 3 of which were supplied by wells, and 4 which utilize Lake Ramsey water. Taste or odour problems were reported in 5 cases.

(b) Private Sewage Disposal

Answers to the questionnaires indicated that 5 of the 83 persons questioned had experienced problems with their septic tank and tile bed systems.

DISCUSSION

WATER QUALITY

Bacteriological

The water quality survey carried out on the south shore of Lake Ramsey during the summer of 1975 indicates a low degree of bacterial contamination. (A maximum value of 32 total coliform organisms/100 ml was found in 11 of the 30 wells sampled).

Coliform organisms were observed in 15 of 45 samples collected from residences using unchlorinated Ramsey Lake water as a source of supply. The counts were, however, minimal with faecal coliforms present in only 4 of these samples. No coliform organisms were detected in chlorinated supplies.

None of the samples collected contained coliform or faecal coliforms in numbers greater than the limit considered acceptable for a private water supply using only chlorination as a method of treatment of the raw water (100 total coliform, 10 faecal coliform/100 ml). Bacteriological contamination was observed throughout the survey area. In general, surface water had higher bacteriological contamination than ground water supplied without a minimum treatment of filtration and chlorination. Chlorinators could be installed on all systems which showed bacteriological contamination to alleviate this problem.

Chemical

Iron concentrations above this Ministry's standards were found in high percentage of well supplies and in a small

number of surface water samples analyzed. Iron concentrations have been successfully reduced using several methods. Many commercial filters will remove iron if it has been oxidized. Oxidation can be effected by aeration or chlorination followed by a contact period. In case of low iron concentrations (up to 5 ppm) the addition of Sodium Silicate coupled with chlorination has been effective in reducing iron.

Chlorides were above this Ministry's standard in 4 isolated samples. This would tend to indicate that chlorides may be entering some individual wells in surface runoff or in domestic sewage. However, since coliform organisms were not detected in any of the affected supplies it would appear that the chlorides could be originating from applications of road salt during the winter.

Colour, turbidity, and specific conductance were above the recommended limits in a high percentage of samples collected. A large percentage of this may be caused by the oxidation and subsequent precipitation of iron and would probably be reduced along with iron concentrations.

Taste or odour problems were reported in 5 cases. Water purifiers and charcoal filters have been found effective in removing taste and odour from potable water. Taste problems may be due to the high iron concentrations detected in some of the water supplies and would be reduced when iron treatment is carried out.

WATER QUANTITY

Water quantity problems could be solved by increasing pump and line sizes from surface supplies.

PRIVATE SEWAGE DISPOSAL

Since bacteriological contamination was minimal in both the surface and ground water supplies sampled, this would tend to indicate that there was a limited number of malfunctioning sub-surface sewage disposal systems.

The small percentage of malfunctioning septic tank and tile bed systems reported during the survey could be repaired on an individual basis.

CONCLUSIONS

Bacteriological contamination of water supplies in the survey area was low and could be corrected on an individual basis by proper disinfection.

Chemical contaminants in the water supplies analyzed were for the most part of a physical nature which causes aesthetic rather than health problems. In most cases it would appear that chlorination of the raw water followed by filtration would reduce the majority of chemical impurities to acceptable limits. Only in a few cases would more elaborate treatment methods be required.

The small percentage of reported malfunctioning private sewage disposal systems could be repaired on an individual basis.

The environmental and potential health problems associated with the private water supply and sewage disposal systems for the existing dwellings can be solved individually, without the installation of communal services.

SOUTH SHORE OF RAMSEY LAKE AREA

Water Quality and Quantity Survey

BACTERIOLOGICAL EXAMINATION RESULTS

Sample No.	Source of Supply	Total Coliform per 100 ml	Faecal Coliform per 100 ml
HR-5	Well	2	0
HR-6	Well	4	0
HR-16	Lake	2	2
HR-17	Lake	2	0
HR-18	Lake	2	2
HR-20	Lake	8	4
HR-31	Lake	Present	0
HR-50	Well	4	0
HR-51	Well	2	2
HR-54	Well	12	0
HR-61	Lake	32	0
HR-62	Well	Present	0
HR-63	Well	10	0
GR-2	Lake	4	2
GR-3	Lake	2	0
GR-4	Lake	4	0
GR-10	Lake	Present	0
GR-17	Lake	Present	0
LR-2	Well	Present	0
LR-6	Lake	6	0
LR-7	Lake	12	0
RL-10	Lake	14	0
RL-12	Lake	10	0
RL-4	Lake	2	0
HR-37	Well	14	0
HR-38	Well	Present	0
HR-40	Well	Present	0

NOTE: *All lake water was obtained from Ramsey Lake*

All other samples examined were satisfactory

SOUTH SHORE OF LAKE RAMSEY AREA
Water Quality and Quantity Survey
Chemical Analysis Results

NAME	SAMPLE NUMBER	HARDNESS as $CaCo_3$ mg/l	ALKALINITY as $CaCo_3$ mg/l	IRON as Fe mg/l	CHLORIDE as Cl mg/l	pH at Lab pH units	APPARENT COLOUR H.U	TURBIDITY UNITS F.T.U.	CONDUCTIVITY micromhos/cm	NITRATES as N mg/l
D. Stortini	•* HR-1	58	.16	.15	35	7.7	10	0.74	240	
E. Lachinski	•* HR-2	58	16	.15	35	7.4	15	1.0	240	
J. Vaura	# HR-3	27	18	.25	35	7.0	20	1.4	245	
R. K. Monahan	# HR-4	342	163	.35	93	7.3	40	2.5	730	
Dr. D. Sloan	# HR-5	58	18	.10	35	6.8	10	0.49	245	
Dr. J. Sturtridge	•* HR-6	58	14	.10	35	7.1	10	0.38	240	
D. Daigel	•* HR-7	58	16	.15	35	7.5	15	1.0	245	
T. Stratdiotto	•* HR-8	58	16	.25	35	7.5	10	1.1	240	
R. Meredith	# HR-10	416	136	1.0	342	7.0	125	48	1540	
Mr. Proulx	# HR-11	472	98	2.3	387	6.5	85	22	1550	
Tap Sample	* HR-12	59	16	.10	35	7.6	15	.82	245	.2
M. Fabbro	* HR-13	404	134	.25	195	7.3	20	0.95	1120	.2
G. E. Collins	* HR-14	58	14	.15	35	7.7	15	1.1	240	.2
T. L. Phillips	* HR-15	58	13	.15	35	7.7	10	0.82	240	.2
Mrs. O. Kirkwood	* HR-16	58	13	.10	36	7.6	15	0.62	240	.2
Mrs. E. Bertrand	* HR-17	58	14	.25	35	7.6	20	1.4	240	.2
Mr. Brunton	* HR-18	1	15	.25	36	7.4	15	1.0	240	.2
Mr. Barth	* HR-19	19	235	.20	515	7.9	10	0.3	2250	.2
T. Fournier	* HR-20	58	16	.20	36	7.5	20	1.2	245	.2
W. C. Muirhead	* HR-21	57	15	.05	36	7.4	15	0.64	245	.2
Ed Cecchetto	* HR-22	58	14	.40	35	7.6	30	2.1	240	.2
G. Helie	•* HR-23	59	15	.05	35	7.5	15	0.50	240	.2
T. Parris	* HR-24	59	16	.10	35	7.3	20	0.69	245	.2

SOUTH SHORE OF LAKE RAMSEY AREA
Water Quality and Quantity Survey
Chemical Analysis Results

NAME		SAMPLE NUMBER	HARDNESS as $CaCo_3$ mg/l	ALKALINITY as $CaCo_3$ mg/l	IRON as Fe mg/l	CHLORIDE as Cl mg/l	pH at Lab pH units	APPARENT COLOUR H.U	TURBIDITY UNITS F.T.U.	CONDUCTIVITY micromhos/cm	NITRATES as N mg/l
L. Anzil	#	HR-25	396	171	1.2	175	7.2	30	8.6	1020	.2
H. Sauve	*	GR-17	59	16	.20	35	7.5	20	1.1	245	.2
V. Mitchell	*	HR-30	60	20	.95	37	7.0	50	3.1	245	.2
L. Gavin	*	HR-31	59	15	.65	36	7.4	30	1.6	240	.2
J. MacLeod	*	HR-32	58	15	.20	36	7.6	15	0.64	235	.2
457 Lakepoint	*	HR-34	252	168	.15	16	7.4	10	0.98	500	.2
E. T. Rolston	*	HR-35	52	18	.10	36	7.0	15	0.87	240	.2
R. E. Garrett	*	HR-36	58	15	.15	37	7.7	15	0.77	240	.2
J. E. Battison	*	HR-37	55	16	.35	37	7.3	15	0.92	240	.2
G. Spergel	*	HR-38	56	15	.40	37	7.6	30	.17	240	.2
M. Hopkins	*	HR-39	56	17	.35	37	7.2	15	1.2	245	.2
R. Moreau	*	HR-33	407	173	2.2	182	7.3	85	12	1015	.2
B. Narozanski	#	HR-40	190	117	.30	15	6.5	10	0.54	405	.2
J. Sabourin	#	HR-41	126	77	.15	8	6.7	10	0.55	275	.2
K. Andresson	#	HR-42	271	184	.60	25	7.2	30	2.9	540	.2
F. Medina	#	HR-43	275	193	.15	22	7.1	5	0.21	550	1.2
A. Rapski	#	HR-58	119	84	1.6	98	6.7	60	12	335	.2

SOUTH SHORE OF LAKE RAMSEY AREA
Water Quality and Quantity Survey
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L. Fletcher	# HR-59	446	270	.55	54	7.2	15	4.0	920	.2
D. Allen	# HR-50	1	272	.30	11	7.4	10	0.71	880	.2
Mr. Charsley	# HR-51	362	262	.80	91	7.3	30	4.8	680	.2
704 Lakepoint	# HR-52	1	190	.35	60	6.7	10	1.2	860	.2
684 Lakepoint	# HR-53	317	197	2.0	46	7.2	85	15	650	.2
J. Andlar	# HR-54	1	181	.30	58	7.2	15	1.4	700	.2
P. Andlar	# HR-55	208	142	.40	10	7.0	15	2.5	420	.2
New Home	# HR-56	443	271	.80	1	7.1	15	3.5	980	.2
A. Grottoli	# HR-57	1	127	.08	4	6.5	10	0.43	570	.2
N. R. Ripley	# LR-1	378	89	4.3	31	6.8	200	34	910	.2
D. Evans	# LR-2	161	106	.60	194	7.1	70	6.4	380	.2
J. Keast	* LR-3	58	16	.10	25	7.5	15	0.64	240	.2
G. Russell	* LR-4	57	14	.05	36	7.3	10	0.55	240	.2
R. Karins	* LR-5	59	15	.05	36	7,2	10	0.58	240	.2
D. Heller	* LR-6	58	16	.10	36	7.3	15	0.62	240	.2
W. Callingham	* LR-7	57	16	.15	36	7.4	15	1.0	240	.2
Mrs. R. Hillman	# LR-8	375	85	3.5	379	6.5	175	20	1540	.2

SOUTH SHORE OF LAKE RAMSEY AREA
Water Quality and Quantity Survey
Chemical Analysis Results

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R. Karins	*	LR-5	59	15	.05	36	7.2	10	0.58	240	.2
D. Heller	*	LR-6	58	16	.10	36	7.3	15	0.62	240	.2
W. Callingham	*	LR-7	57	16	.15	36	7.4	15	1.0	240	.2
Mrs. R. Hillman	#	LR-8	375	85	3.5	379	6.5	175	20	1540	.2
J. Cole	*	GR-1	61	18	.25	35	7.7	20	1.5	245	.2
Whissell	*	GR-2	58	16	.15	35	7.4	10	0.98	240	.2
J. MacIsaac	*	GR-3	58	15	.10	35	7.4	10	.90	240	.2
J. Stewart	*	GR-4	58	16	.10	35	7.5	10	.89	290	.2
H. A. Supple	*	GR-5	58	16	.10	35	7.6	15	.87	240	.2
P. Grossgove	*	GR-6	58	15	.10	35	7.0	15	.82	240	.2
R. Warren	*	GR-7	57	15	.10	35	7.3	15	.85	240	.2
R. Pelton	*	GR-8	58	13	.10	35	7.3	20	.77	240	.2
G. A. Bouchard	*	GR-9	59	17	.10	40	7.6	10	.72	245	.2
L. Ripa	*	GR-10	58	14	.10	33	7.6	5	.35	240	.2
A. J. Arena	*	GR-11	58	15	.10	35	7.5	10	.95	240	.2
S. Morehouse	*	HR-12	59	15	.05	35	8.0	10	.58	245	.2
W. M. Fournier	*	GR-13	57	15	.05	35	7.7	10	.58	245	.2

SOUTH SHORE OF LAKE RAMSEY AREA
Water Quality and Quantity Survey
Chemical Analysis Results

NAME		SAMPLE NUMBER	HARDNESS as $CaCo_3$ mg/l	ALKALINITY as $CaCo_3$ mg/l	IRON as Fe mg/l	CHLORIDE as Cl mg/l	pH at Lab pH units	APPARENT COLOUR H.U	TURBIDITY UNITS F.T.U.	CONDUCTIVITY micromhos/cm	NITRATES as N mg/l
R. Lewis	*	GR-14	58	14	.10	35	7.6	5	.66	240	.2
McCullough	*	GR-15	58	15	.25	35	7.8	40	2.0	245	.2
J. Pappin	#	GR-16	198	13	1.9	20	7.1	70	6.6	425	.2
Lafreniere	#	RL-13	137	86	.05	7	7.1	5	0.65	295	.2
Naylor	#	RL-14	262	82	.85	138	6.5	30	7.2	720	.2
M. Lebel	#	RL-15	32	9	.20	4	5.7	10	0.65	97	.2
New House on Keast	*	HR-60	102	19	.30	128	6.2	10	· 2.8	560	.2
J. R. Perras	*	HR-61	60	15	.20	35	7.1	10	0.70	240	.2
E. Bromberg	#	HR-62	172	108	2.4	25	7.3	60	14	395	.2
H. Boines	#	HR-63	83	47	.10	88	8.0	40	2.0	430	.2
F. Hibbard	#	HR-65	85	63	.65	1	7.2	20	6.5	195	.2
J. Jerome	*	RL-10	57	15	.10	35	7.3	10	0.55	240	.2
Wardill	#	RL-11	158	110	.15	21	7.8	10	1.6	355	.2
C. Haffey	*	RL-12	54	18	.20	35	7.6	15	1.6	245	.2

* - Surface Water

\# - Well Water

. - Chlorinated

APPENDIX III

GLOSSARY

(i) BACTERIOLOGICAL EXAMINATION

Total Coliform Organisms

Total coliform organisms include a wide variety of bacteria ranging from the genus (Group), Escherichia Coli, which originate mainly in the intestines of man and other warm-blooded animals, to the genera Citrobacter and Enterobacter aerogenes. The latter genera are basically found in soil but are also present in faeces in small numbers.

The presence of total coliforms in water may indicate soil runoff or more important, less recent faecal pollution since organisms of the Enterobacter - Citrobacter groups tend to survive longer in water than do members of the Escherichia Coli group, and even multiply when suitable environmental conditions exist.

Faecal Coliform Organisms

The faecal coliform organisms are those coliform bacteria which are all intestinal in origin and usually outnumber all other coliform types in human and animal intestines. Most of the coliform bacteria found by the faecal coliform test are of the genus Escherichia Coli. However, their death rate outside the warm body is high and accordingly if coliforms present in the water are primarily faecal coliforms, and their number is high, the pollution is probably nearby and recent. Smaller numbers with a high portion of faecal coliforms may indicate nearby pollution with counts reduced by dilution.

Results are reported "coliform count per 100 millilitres".

(ii) CHEMICAL ANALYSIS

Hardness

The total hardness measures the "soap consuming power" of a water due to the presence of metallic cations. The principle components of hardness are calcium and magnesium although a number of heavy metals may contribute to a small extent. The hardest waters are usually encountered in regions with thick top soil layers and extensive limestone deposits.

Hard waters are objectionable because they form insoluble compounds or curds with soap. This substantially reduces the efficiency of washing procedures even when detergents are used. Waters with high hardness are known to cause the formation of a lime scale in plumbing fixtures.

Alkalinity

The alkalinity of the water is generally used to define the buffering capacity or the waters capability to resist a change in pH. This means that if an acidic waste is discharged to a natural water system the effect on the water may not necessarily be detected as a pH change but will be detected as a drop in alkalinity.

Iron

Iron is the most abundant of the heavy metals in nature, but despite this abundance, it is generally found in relatively low levels in natural surface waters. Iron is non-toxic even at high levels but becomes objectionable in water because of the colour and bitter taste it imparts. The water quality objective for Ontario drinking water is 0.3 mg/l as iron.

Chloride

Chloride is a major anion in domestic wastes and in many natural water supplies. Urban runoff often contains high concentrations of chloride in the winter time due to road application of salt.

Chloride poses no direct health hazard, but the water quality objective for domestic water supplies has been specified at 250 mg/l to prevent a salty taste. This salty taste is variable and dependent on the composition of the water. If chloride is present as sodium chloride a detectable taste will be present at 250 mg/l. If chloride is present as calcium or magnesium chlorides, waters containing as much as 1,000 mg/l may not have a noticeable taste.

pH

The Hydrogen Ion concentration in water is measured as pH. Specifically, it is the negative logarithm of the hydrogen ion concentration expressed in moles per litre. Thus, each change of one unit in pH corresponds to a 10 fold change in the hydrogen ion concentration.

Apparent Colour Units

Many lakes and rivers, especially in Northern Ontario, have a characteristic yellowish-brown colour due to the presence of humic acids derived from the decomposition of plants. Lakes of this type are commonly referred to as "acid bog" or "brown water" lakes. A similar colour may also occur when iron and maganese are found in abundance.

Water coloured naturally by humic substances is harmless, but considered unacceptable for drinking purposes because of its appearance. The objective of 5 colour units for domestic water supplies is therefore based on aesthetic rather than on health standards.

Turbidity

The turbidity is a measure of the opticle properties of a sample which causes light to be scattered and adsorbed rather than transmitted in a straight line. Historically, the turbidity was measured using a Jackson candle turbidmeter, but the insensitivity of this instrument lead to the development of secondary techniques which can measure the much lower turbidities commonly encountered in modern water treatment processes.

Specific Conductance

The specific conductance is a measure of a waters capacity to carry an electric current. This property is related to the total concentration of ionized substances in the water. The conductivity of natural waters is mainly due to the presence of calcium, magnesium, sodium, potassium, bicarbonate, chloride, sulphate and nitrate ions.

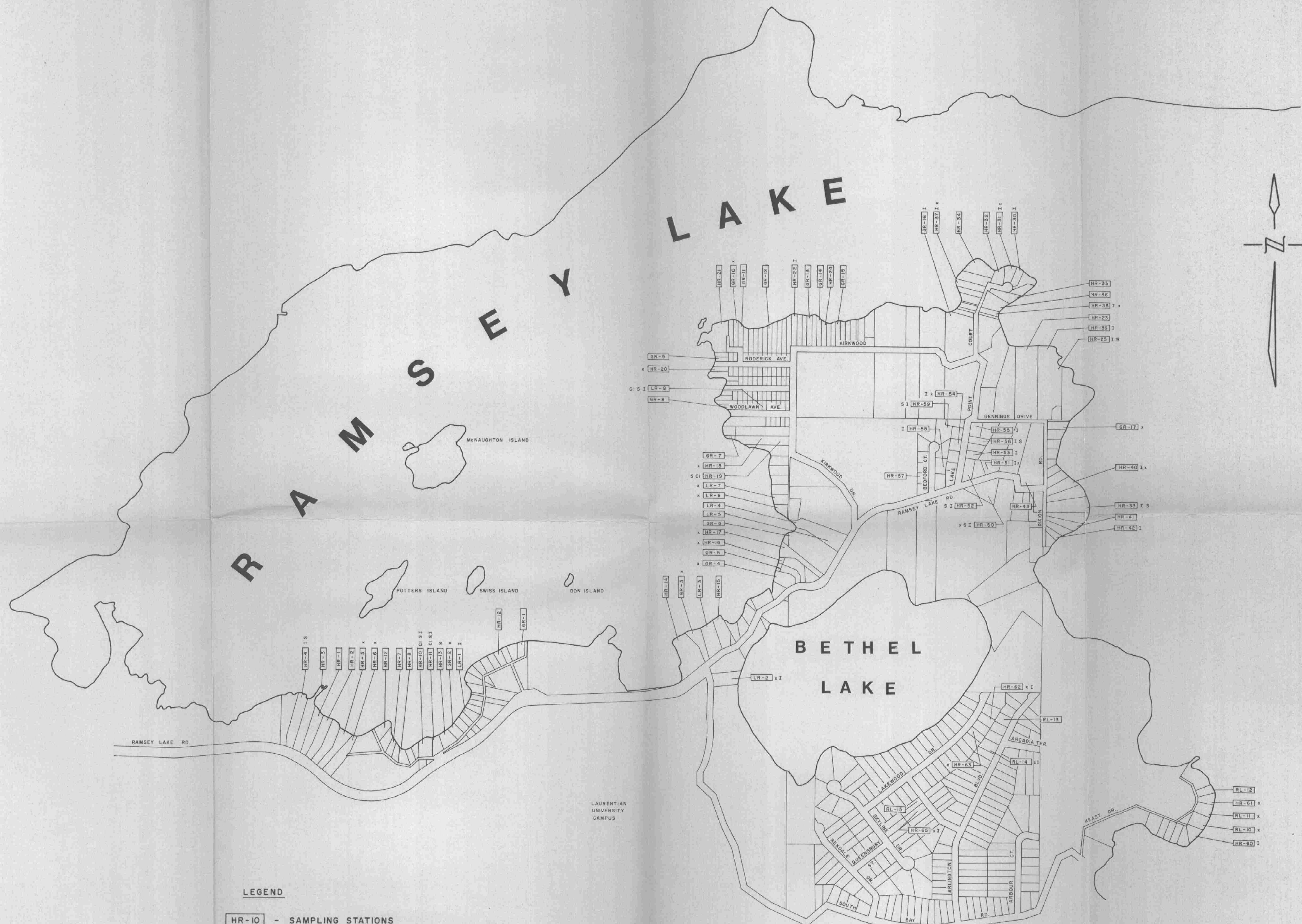
Specific conductance relates quite well to the total dissolved solids concentration. Ontario rivers and lakes free of industrial wastes, have a total dissolved solids concentration general equal to 0.65 ± 0.10 x the specific conductance.

Nitrate (Nitrogen)

Nitrates are formed via the oxidation of nitrite by autotrophic nitrifying bacteria and represents the most highly oxidized form of nitrogen in the nitrogen cycle. It is generally found at trace levels in all surface waters but may become very high in ground waters as a result of soil leaching.

Nitrates are objectionable because their nutritive properties promote the excessive growth of algae and other aquatic plants. Excessive amounts in drinking water contribute to a disease known as infant methemoglobinemia in which the oxygen carrying capacity of the blood is inhibited. The maximum acceptable level for domestic water supplies in Ontario is 10 mg/l of nitrate as nitrogen in the water if it is to be used for infant feeding. Nitrates are non-toxic to adults.

SUDBURY - RAMSEY LAKE
SOUTH SHORE



LEGEND

HR-10	- SAMPLING STATIONS
x	- COLIFORM PRESENT
I	- IRON ABOVE 0.3 mg/l
Cl	- CLORIDE ABOVE 250 mg/l
S	- SPECIFIC CONDUCTANCE ABOVE THE MIN. STANDARDS

MINISTRY OF THE ENVIRONMENT

SOUTH SHORE OF LAKE RAMSEY

1975 WATER QUALITY SURVEY

SCALE: 1" = 700 FEET APPROX	
DRAWN BY: R.S.	DATE: DEC. 1975
CHECKED BY:	DRAWING No: 5866

Date Due

MAY 2 7 1977			